ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022

Sensory Profile of Fresh Goat Milk Based Probiotic Yogurt Incorporated with Stevia Extract and Stevia Powder and Assessment the Impact on PH and Titratable Acidity During Storage

Jaspreet Kaur [1]*, Dr. Sarla Lakhawat [2]

[1, 2] Department of Food Science and Nutrition,CCAS, , Udaipur, Rajasthan, India.

Email- [1] jaspreetmaan9319@gmail.com

ABSTRACT:

Yogurt is a popular fermented product. Due to health awareness people want to reduce sugar consumption, finding the availability of suitable alternative sweeteners and the new vehicle for delivery of probiotics due to their benefits for health. Goat milk can deliver probiotics and stevia provides a sweet taste along with an alternative other calorie-dense sweeteners. So goat milk-based probiotic yogurt samples from *L. helvaticus* (Probiotic culture) incorporated with stevia extract, stevia powder and different flavours (Kevda, Kesar Pista and Raspberry) reduce the gotty flavours were amalgamated. By observing the mean score of overall acceptability yogurt prepared with stevia powder and extract, Yogurt prepared with stevia extract obtained more scores compared with yogurt prepared with stevia powder; however, control obtained lower scores compared flavoured probiotic yogurt. Among all the samples highest score was obtained, in yogurt highest score was Kevda, Kesar Pista and Raspberry which was prepared with stevia extract and stored for 11 days. The pH levels varied for YS_0, YS_1, YS_2 and YS_3 were 4.03-4.36, 4.00-4.38, 4.01-4.37 and 3.99-4.37, respectively. The titratable acidity varies for YS_0, YS_1, YS_2 and YS_3 was 0.86-1.20, 0.85-1.23, 0.85-1.21 and 0.84-1.26 per cent, respectively. The significant impact of storage was observed on the yogurt samples.

Keywords: Flaours, pH, stevia extract, stevia powder, titratable acidity andYogurt.

INTRODUCTION:

Yogurt is produced by lactic acid fermentation of lactose by lactic acid bacteria, for instance, L. *bulgaricus* and S. *thermophilus.* These bacteria provide a specific texture, composition and organoleptic properties of yogurt (Chandan *et al.* 2006). There are various types of yogurts prepared by different milk. Plain fermented dairy products have a sour taste and are hence not preferred by some consumers. Their flavours may need to be improved with sweeteners (Varga, 2006 and Sert *et al.* 2011). Stevia which is a bio sweetener can fulfill this demand and also helps to reduce obesity (Margaret, 2015). Stevia provide sweet taste for those people which restricted for sucrose and other sugars which enhance the blood glucose level. So

ISSN PRINT 2319 1775 Online 2320 7876

Research paper **© 2012 IJFANS. All Rights Reserved,** UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022

stevia can be alternative to provide sweet taste for diabetic mellitus, overweight and for obese.

Probiotics are live microorganisms which are beneficial for the host .Intestinal microbiota, which have been constituents by hundreds of different bacterial species. *Lactobacillus* and *Bifidobacterium* species have been reported to be the beneficial probiotic bacterial cultures. The representative species include *L. acidophilus*, *L. casei*, *B. lactis*, *B. longum*, and *L. plantarum* *B. bifidum* (Kailasapathy and Chin 2000; Ishibashi and Yamazaki 2001). So these bacteria need a medium to deliver benefits to the host. Caprine (Goat) milk can play a vital role to deliver the probiotic culture but it has gotty flavour, which provides it less pleasing flavour. Dairy industry alleged to produce various dairy products from goat milk due to its property of easily digestibility and helps to recover lactose intolerance (Albano et al., 2018, Senaka *et al.* 2012). It is preferred food after mother milk due to its digestibility for infants. It contains smaller fat globules and its fat's composition has 5:1 ω three and five fatty acids which are recommended composition to prevent the cardiovascular disease (Tripathi, 2015, Tarola, 2019). The present study was planned to prepare goat milk based probiotic products includes starter culture (*Streptococcus thermophilus* MD2), probiotic culture (*Lactobacillus helveticus* MTCC 5463) and stevia extract and powder with different flavours.

MATERIAL AND METHODS:

Raw material:

Caprine (Goat) Milk and stevia extract was obtained from near village of Udaipur and Udaipur city respectively

Bacterial culture:

Starter culture *S. Thermophilus* MTCC 5460 and probiotic culture *L. helveticus* MTCC 5463 were procured from SMC College of Dairy Science, Aanand Agriculture university, Gujarat and Stored at 4±2º C during the research period (2020-22).

Sample No.	Composition of yogurt		
	Curd	Flavour(%)	Stevia
YS_0	100	Without flavour	Without Stevia
YS_1	100	Kevada	Stevia Extract (90µl)
YS_2	100	Kesar Pista	Stevia Extract (90µl)
YS_3	100	Raspberry	Stevia Extract (90µl)
YS_4	100	Kevada	Stevia Powder(0.40g)
YS_5	100	Kesar Pista	Stevia Powder(0.40g)
YS_6	100	Raspberry	Stevia Powder(0.40g)

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022

Preparation of Yogurt

Straining of milk

⇩

Homogenization

⇩

Pasteurization

⇩

Maintain to Incubation temperature

⇩

Addition of Both Culture(1:1)

⇩

Fermentation/incubation(37±2ºC)

⇩

Cooling

⇩

Stirring and addition of flavours and stevia extraxt

⇩

Packaging and Cold storage (4±2ºC)

Flow diagram for preparation of Yogurt from Modified from Weerathilake (2014), Lee and Lucey. (2010).

Sensory profile evaluation:

The sensory qualities of each developed product were rated on a nine-point hedonic scale in the current research. The aim was for the subject to select the score that best reflected their opinion of the product. The evaluations were given numerical values for computations, ranging from 9 (Liked extremely) to 1 (disliked extremely).

Determination of pH:

The pH of probiotic *Lassi* and yogurt was determined using a Digital pH meter (Hana pH meter No. 211). The pH meter was standardised using pH 4.0 and pH 7.0 buffer solutions. The yogurt samples were stirred with a small amount of distilled water before pH measurement. pH was measured over several days.

1 Determination of Titratable Acidity

Titratable acidity of yogurt was determined by the procedure described in (IS: 1479, part I, 1960).

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022

RESULTS AND DISCUSSION:

SENSORY PROFILE OF PROBIOTIC YOGURT AT THE DAY OF PREPARATION:

Colour and appearance score of probiotic yogurt on the day of preparation:

Appearance is a key component of sensory assessment. The vision system is the detector of appearance. Using the eyes, we can measure optical and physical characteristics. The colour and appearance score of yogurt on the day of preparation is presented in Table 1.The highest average value for colour and appearance was observed in YS_2 (8.40) which was "liked very much", followed by YS_1 (8.27), YS_3, YS_4 and YS_5 (8.20) lowest score was found in $YS_6$and YS_0(8.13), respectively which was also obtained score "liked very much" category. Yogurt samples prepared with stevia extract and powder did not differ significantly.

Phalguni *et al.*(2020) investigated the effects of utensils used in curd preparation on sensory profile. The curd was prepared by T_1- utilising earthen, T_2- stainless steel, T_3- aluminium, T_4-plastic and T_5-china clay utensils with colour and appearance scores recorded for five treatments 8.70, 7.73, 7.11,6.91and 8.45, respectively.

Flavour score of probiotic yogurt on the day of preparation:

The flavour of any food substance plays a vital role in the acceptability of particular food and makes the foodstuff innovative**.** The flavour score of yogurt on the day of preparation is presented in Table1 .The highest average value for flavour was observed in YS_2 (8.00) which was "liked very much" followed by YS_1, YS_3 (7.93), YS_5 (7.87), YS_4 (7.73) and YS_6 (7.60) lowest score was observed in YS_0 (6.87), respectively which was "liked slightly". Flavoured yogurt obtained more scores compared to control. A significant difference ($p<0.05$) was found between the samples of yogurt prepared with stevia extract and powder.

Phalguni *et al.* (2020) investigated the effects of utensils used in curd preparation on sensory profile. The curd was prepared by T_1- utilising earthen, T_2- stainless steel, T_3- aluminium, T_4-plastic and T_5-china clay utensils with flavour scores were recorded for five treatments 8.33, 8.14, 7.93, 7.65 and 8.58, respectively.

Consistency score of probiotic yogurt on the day of preparation:

Consistency in dairy products refers to uniformity and its compatibility with other components. The consistency score of yogurt on the day of preparation is presented in Table 1.The highest average value for consistency was observed in YS_2 (8.40) which was "liked very much" followed by YS_1 (8.20), YS_3 (8.13) and YS_4 YS_5 (8.07) lowest score was determined in YS_0 and YS_6 (8.00), respectively which was also found in category "liked very much. No significant difference in consistency score ($p<0.05$) was found between the samples of yogurt prepared with stevia extract and powder.

ISSN PRINT 2319 1775 Online 2320 7876

Research paper **© 2012 IJFANS. All Rights Reserved, UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022**

Phalguni *et al.* (2020) investigated the effects of utensils used in curd preparation on sensory profile. The curd was prepared by T_1- utilising earthen, T_2- stainless steel, T3- aluminium, T_4-plastic and T_5-china clay utensils with body and texture were recorded for five treatments 8.67, 7.54, 7.24, 6.92 and 8.34, respectively.

Mouth feel score of probiotic yogurt on the day of preparation:

Mouth feel is a crucial sensory facet of exploring the overall flavour and taste. Sometimes it is referred to as texture. The mouth feels score of yogurt on the day of preparation is presented in Table1.The highest average value for mouth feel was observed in YS_2 (8.00), which was "liked very much" followed by YS_3 (8.93), YS_1 (7.80), YS_5 (7.20), YS_4 (7.13), YS_6 (7.07) however, the lowest score was determined in YS_0 (6.87), respectively which was "liked slightly". A significant difference ($p<0.05$) was found between the samples of yogurt prepared with different flavours, stevia extract and powder.

Overall acceptability score of probiotic yogurt on the day of preparation:

The acceptance or rejection of food entirely depends on whether it corresponds to consumer expectations and needs (Mosca *et al.*2015). The process through which an individual accepts or rejects food is considered to be of a multi-dimensional nature and is measured by overall acceptability. The overall acceptability score of yogurt on the day of preparation is presented in Table 1 . The highest average value for overall acceptability was observed in YS_2 (8.12) which was "liked very much", followed by YS_3 (8.07), YS_1 (8.00), YS_5 (7.20), YS_4 (7.13) YS_6 (7.07) however lowest score was determined in YS_0 (7.00), respectively which was "moderately liked" by the panel members. There was a significant difference ($p<0.05$) found between the score of overall acceptability allotted by panel members to the samples of yogurt prepared with stevia extract and powder.

The satiety of yogurts was directly correlated to sweetness level. Liking for chocolate bars and peaches declined after panellists were served yogurt with a high sweetness level. The reason behind this decrease in liking was found to be the overwhelming sweetness which concealed the characteristic yogurt sour taste (Desai, 2012). Phalguni *et al.* (2020) also investigated the effects of utensils used in curd preparation on sensory profile. The curd was prepared by T_1- utilising earthen, T_2- stainless steel, T_3- aluminium, T_4-plastic and T_5-china clay utensils with overall acceptability were recorded for five treatments 8.78, 8.15, 7.93, 7.53 and 8.54, respectively.

By observing the mean score of overall acceptability yogurt prepared with stevia powder and extract, Yogurt prepared with stevia extract obtained more scores compared with yogurt prepared with stevia powder; however, control obtained lower scores compared flavoured probiotic yogurt. Among all the samples highest score was obtained, in yogurt highest score was Kevda, Kesar Pista and Raspberry which was prepared with stevia extract. So stevia extract incorporated products were selected for further elaution of pH and titratable acidity .

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022

Table 1 Sensory profile of fresh probiotic yogurt incorporated with stevia extract and powder

Sample No.	**Colour and Appearance**	**Flavour**	**Consistency**	**Mouth feel**	**Overall acceptability**
YS_0 (C)	8.13±0.19	6.87±0.13	8.00±0.23	6.87±0.22	7.00±0.23
YS_1 (K+SE)	8.27±0.18	7.93±0.22	8.20±0.16	7.80±0.13	8.00±0.17
YS_2 (KP+SE)	8.40±0.15	8.00±0.26	8.40±0.14	8.00±0.24	8.12±0.18
YS_3 (R+SE)	8.20±0.18	7.93±0.22	8.13±0.17	7.93±0.18	8.07±0.18
YS_4 (C+SP)	8.20±0.21	7.73±0.23	8.07±0.18	7.13±0.17	7.13±0.25
YS_5 (K+SP)	8.20±0.19	7.87±20	8.07±0.19	7.20±0.26	7.20±0.26
YS_6 (KP+SP)	8.13±0.17	7.60±21	8.00±0.26	7.07±0.16	7.07±0.24
S.Em. ±	**0.18**	**0.14**	**0.20**	**0.20**	**0.22**
C.D. (P = 0.05)	**NS**	**0.40***	**NS**	**0.57***	**0.63***
C.V. %	**8.64**	**7.63**	**9.44**	**10.00**	**11.60**
Note: YS: Yogurt Sample, C- Control (Without flavour and stevia extract), K – Kevda Flavour, KP- *Kesar Pista* Flavour, R- Raspberry Flavour, SE- Stevia Extract, (NS)- Non Significant, (Mean ±S.Em),*Significant at 5% level of significance.					

pH level of probiotic yogurt during storage:

Table 2 showed that the pH levels varied for YS_0, YS_1, YS_2 and YS_3 were 4.03-4.36, 4.00-4.38, 4.01-4.37 and 3.99-4.37, respectively. On the day of preparation highest score was YS_1 (4.38) and the lowest score was YS_0 (4.36), whereas, on the 11th day of storage, the highest score was observed in YS_0 (4.03) and the lowest score was YS_3 (3.99). There was significant effect ($p<0.05$) of storage has been observed.

Paz-Díaz *et al.* (2021) reported the similar behaviour of the samples after seven days of storage under refrigeration conditions. The reduction in pH and the increase in the total acidity of yogurts during storage could possibly be explained due to the increased consumption of residual lactose by lactic acid bacteria (Curti *et al.* 2017).

Table 2 pH levels of probiotic yogurt during storage

Sample No.	**Fresh**	**3rd day**	**5th day**	**7th day**	**9th day**	**11th day**	**Mean**	**S.Em. ±**	**C.D. (P = 0.05)**	**C.V. (%)**
YS_0 (C)	4.36 ±0.02	4.31 ±0.01	4.29 ±0.01	4.28 ±0.04	4.19 ±0.08	4.03 ±0.03	4.24	**0.05**	**0.15***	**2.59**
YS_1 (K+SE)	4.38 ±0.03	4.33 ±0.04	4.30 ±0.09	4.25 ±0.01	4.18 ±0.02	4.00 ±0.01	4.24	**0.07**	**0.20***	**3.79**

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022

YS_2 (KP+SE)	4.37 ±0.02	4.30 ±0.02	4.28 ±0.08	4.24 ±0.06	4.17 ±0.02	4.01 ±0.02	4.22	**0.04**	**0.11***	**2.17**
YS_3 (R+SE)	4.37 ±0.03	4.31 ±0.02	4.29 ±0.05	4.27 ±0.04	4.16 ±0.06	3.99 ±0.03	4.23	**0.04**	**0.11***	**1.94**
Mean	**4.37**	**4.31**	**4.29**	**4.26**	**4.17**	**4.00**	**Note:** YS: Yogurt Sample, C-Control (Without flavour and stevia extract), K – Kevda Flavour, KP- *Kesar Pista* Flavour, R- Raspberry Flavour, SE- Stevia Extract, (NS)- Non Significant, (Mean ±S.Em), *Significant at 5% level of significance.Each value is the average of five replications.			
S.Em. ±	**0.02**	**0.04**	**0.05**	**0.05**	**0.04**	**0.02**				
C.D. (P = 0.05)	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**				
C.V. (%)	**1.26**	**0.95**	**1.12**	**1.23**	**1.09**	**1.27**				

Other studies reported that the pH of yogurt decreased during storage under refrigeration conditions between 3.8 and 4.5 (Aryana and Olson, 2008).

Kaur and Riar, (2020) reported that during the first day of storage, pH of YBG_4 yoghurt sample obtained was 4.0, which further decreased to minimum value of 3.7 after 14 days of storage. The decline in pH during storage might be due to the utilization of residual carbohydrates by viable microorganisms and production of lactic acid as well as due to small amounts of CO_2 and formic acid from lactose (Nikoofar *et al.* 2013). The decrease in pH is due to the microorganism's activity, whereas some researchers demonstrated that the decline in pH during storage period was the result of residual enzymes produced by starters during fermentation (Christopher *et al.* 2009)

Titratable acidity level of probiotic yogurt during storage:

Table 3 showed that the titratable acidity varies for YS_0, YS_1, YS_2 and YS_3 was 0.86-1.20, 0.85-1.23, 0.85-1.21 and 0.84-1.26 per cent, respectively. On the day of preparation highest score was LS_0 (0.86%) and the lowest score was YS_3 (0.84%), whereas, on the 11th day of storage, the highest score was observed in YS_3 (1.26%) and the lowest score was found in YS_0 (1.20%).

Table 3 Titratable acidity (%) of probiotic yogurt during storage

Sample No.	**Fresh**	**3rd day**	**5th day**	**7th day**	**9th day**	**11th day**	**Mean**	**S.Em. ±**	**C.D.(P = 0.05)**	**C.V. (%)**
YS_0 (C)	0.86	0.87	1.00	1.10	1.13	1.20	1.02	0.07	**0.20***	**3.35**
YS_1 (K+SE)	0.85	0.88	0.98	1.12	1.18	1.23	1.04	0.06	**0.16***	**4.87**

ISSN PRINT 2319 1775 Online 2320 7876

Research paper **© 2012 IJFANS. All Rights Reserved,** **UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022**

YS_2 (KP+SE)	0.85	0.90	1.03	1.07	1.19	1.21	1.05	0.04	**0.10***	**2.94**
YS_3 (R+SE)	0.84	0.89	1.04	1.04	1.17	1.26	1.04	0.05	**0.16***	**5.32**
Mean	**0.85**	**0.88**	**1.01**	**1.08**	**1.16**	**1.21**	**Note:**YS: Yogurt Sample, C-Control (Without flavour and stevia extract), K – Kevda Flavour,KP- *Kesar Pista* Flavour, R- Raspberry Flavour, SE- Stevia Extract, (NS)- Non Significant, (Mean ±S.Em), *Significant at 5% level of significance.Each value is the average of five replications.			
S.Em. ±	**0.01**	**0.02**	**0.03**	**0.01**	**0.02**	**0.01**				
C.D. (P = 0.05)	**NS**	**NS**	**NS**	**NS**	**NS**	**0.03***				
C.V. (%)	**3.63**	**4.20**	**5.62**	**2.72**	**3.02**	**1.84**				

Pagthinathan *et al.* (2018) also reported average acidity of without probiotic yoghurt was 0.65 per cent and 0.4 per cent probiotic added yogurt was 0.67 per cent. The results showed that acidity be inclined to increase in all types of yogurt during storage period. Kaur and Riar, (2020) also indicated an increase in the acidity rate in the yogurt treatments from 1.22 per cent for the control treatment to 1.41 per cent for the yogurt treatment containing 2 per cent beta-glucan and there were no significant differences ($P \leq 0.05$).

CONCLUSION:

In can be concluded that goat milk based probiotic yogurt which can be incorporated both as stevia powder and extract but between both stevia extract is more acceptable and can be stored for 11 days. However it has significant impact of storage duration on pH and titrable acidity.

REFERENCES:

1. Albano, C. Morandi, S. Silvetti, T. Casiraghi, M.C. Manini, F. and Brasca, M. 2018. Lactic acid bacteria with cholesterol-lowering properties for dairy applications: In vitro and in situ activity. *Journal of Dairy Science.* **101**:10807-18.
2. Aryana, K. J. and Olson, D. W. 2017. A 100-Year Review: Yogurt and other cultured dairy products. *Journal of Dairy Science.* **100** (12): 9987- 10013.
3. Chandan, R.C. and O'Rell, K. Kumar, R. 2006. Principles of Yogurt Processing, In Manufacturing Yogurt and Fermented Milks. Blackwell Publishing: Oxford, UK. p. 195-209.
4. Christopher, M.D. Reddy, V.P. Venkateswarlu, K. 2009. Viability during storage of two Bifidobacterium bifidum strains in set and stirred flavoured yoghurts containing whey protein concentrates. *Natural product radiance"*. **8**:25–31.

ISSN PRINT 2319 1775 Online 2320 7876

Research paper **© 2012 IJFANS. All Rights Reserved,** **UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022**

5. Curti, C.A. Vidal, P.M. Curti, R.N. Ramón, A.N. 2017. Chemical characterization, texture and consumer acceptability of yogurts supplemented with quinoa flour. Food Science and Technology (Brasil). **37**(4):627-631.

6. Desai, N. 2012. Sensory Properties and Drivers of Liking for Greek Style Yogurts. (Under the direction of Dr. MaryAnne Drake.)

7. Indian Standards (1960) IS: 1479. Methods of testing for dairy industry. Part-I. Rapid examination of milk. Indian Standards Institution, New Delhi.

8. Ishibashi N, Yamazaki S. Probiotics and safety. The American Journal of Clinical Nutrition. 2001;73(2):465–470.

9. Kailasapathy K, and Chin J. 2000. Survival and therapeutic potential of probiotic organisms with reference to *Lactobacillus acidophilus* and *Bifidobacterium* spp. Immunology and Cell Biology. 78(1):80–88.

10. Kaur, R. and Riar, C.S. 2020. Sensory, rheological and chemical characteristics during storage of set type full fat yoghurt fortified with barley β-glucan. *Journal of food science and technology*. **57**(1): 41-51.

11. Lee, W. J. and Lucey, J. A. 2010. Formation and physical properties of yogurt. *Asian-Australasian Journal of Animal Sciences.* **23**(9): 1127-1136.

12. Margaret, A. (2015). Stevia, Nature's Zero-Calorie Sustainable Sweetener, *Nutrition Today, 50(3),* 129–134.

13. Mosca, A.C. van de Velde, F. Bult, J.H. van Boekel, M.A. Stieger, M. 2015. Taste enhancement in food gels: Effect of fracture properties on oral breakdown, bolus formation and sweetness intensity. *Food Hydrocolloids*. **43**:794-802.

14. Nikoofar, E. Hojjatoleslamy, M. Shakerian, A. Molavi, H. and Shariaty, M.A. 2013. Surveying the effect of oat b-glucan as a fat replacer on rheological and physicochemical characteristics of non-fat set yoghrt. *International Journal of Farming and Allied Sciences*. **2**(20):790–796.

15. Pagthinathan, M. Nafees, M.S.M. and Powsika, E. 2018. Evaluate the physical, chemical and sensory parameters of probiotic yoghurt during storage. *AGRIEAST*. **12**(2): 10-18.

16. Paz-Díaz, H.J. Mora-Vergara, L.Z. Navarro-Arana, C.E. Navarro, A.S. Pacheco-Valderrama, M.M. 2021. Effect of process variables on the physicochemical and rheological properties of yogurt. *La Revista U.D.C.A Actualidad & Divulgación Científica es una revista multidisciplinar, arbitrada, de acceso abierto y de producción*. **24**(1):1922.

ISSN PRINT 2319 1775 Online 2320 7876

Research paper **© 2012 IJFANS. All Rights Reserved, UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022**

17. Phalguni, N. Khadse, A.S. Ingole, K.R. Kadu and B.R. Wankhade. 2020. Studies on sensory evaluation and cost configuration of curd prepared by using different utensils. *The Pharma* Innovation *Journal*. **9**(12): 367-369.

18. Senaka, R. C. Evans, C.A. Adams, M.C. Baines, S.K. 2012. Probiotic viability and physico-chemical and sensory properties of plain and stirred fruit yogurts made from goat's milk. *Food Chemistry*. **135**(3):1411-1418.

19. Sert, D. Akin, N. Dertli, E. 2011. Effects of sunflower honey on the physicochemical, microbiological and sensory characteristics in set type yoghurt during refrigerated storage.*International Journal of Dairy Technology.***64**: 99–107.

20. Tarola A. M. R. Preti, A. M. Girelli, P. 2007. Campana Recent Advances in the Valorization of Goat Milk: Nutritional Properties and Production Sustainability: *World Academy of Science, Engineering and Technology. International Journal of Nutrition and Food Engineering.* **13**(6): 20-27.

21. Tripathi, M. K. 2015. Comforts in Quality and Production of Goat Milk. *Advances in Dairy* Research. **3**:1.

22. Varga, L. 2006. Effect of acacia (*Robinia pseudo-acacia* L.) honey on the characteristic microflora of yogurt during refrigerated storage. *International Journal of Food Microbiology.***108**(2):272-275.

23. Weerathilake, W.A.D.V. Rasika, D.M.D. Ruwanmali J. K. U. and Munasinghe, M. A.D.D. (2014). The evolution, processing, varieties and health benefits of yogurt. *International Journal of Scientific and Research Publications*. **4**(4):2250-3153.